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Do We Think Ourselves Sick? Psychological Processes and Health Behaviors Associated with Adolescents' Somatic Complaints

Sigurlina Davidsdottir¹

¹ Faculty of Social Sciences, University of Iceland, Reykjavik, Reykjavik, Iceland

Correspondence: Sigurlina Davidsdottir (linadav@hi.is)

ABSTRACT - The effects of psychological variables as measured by health hardiness, life orientation, perceived stress, Type A behavior, anxiety, and attributional style were contrasted with lifestyle as measured by alcoholism, smoking, exercise for their association with somatic complaints. The sample consisted of 105 psychology undergraduate students in a midwestern university. Psychological processes were better predictors of somatic complaints than lifestyle. A statistically significant association was found between somatic complaints and the following psychological processes: pessimism, Type A, perceived stress, anxiety, and global explanatory style for bad events. Health control and health challenge were negatively correlated with somatic complaints. Psychological variables explained 40% of the variance in somatic complaints, but lifestyle variables had little association with such complaints.

Keywords:

Somatic complaints;
Perceived stress;
Type A behavior
pattern; Anxiety;
Attributional style;
Health hardiness;
Lifestyle factors

Introduction

The link between behavior and health has been explored for some time, as has the link between psychological processes and health. It has, for example, been found that alcoholism is detrimental to health (Davidsdottir, 1993; NIH, 1998) and that smoking is a serious hazard to health (Centers for Disease Control, 1990). Additionally, the value of exercise to health has also been known for some time (Ballard et al., 1990; Cohen & Williamson, 1988; Wu et al., 1987; Perlmutter, 1990; Frederiksson et al., 1989).

Individuals' perception that they have control over their lives has often been associated with positive health outcomes (Langer & Rodin, 1976; Schulz, 1976; Schulz & Hanusa, 1978; Suls & Mullen, 1981; Taylor et al., 1991; Taylor et al., 1984). Exactly how this operates is not well known. For a better understanding of how the relationship of control and physical health works, Seeman and Seeman (1983) found that people with low control were less involved with self-initiated care, they were less optimistic about treatment outcomes and they rated their health worse. They also had more illness episodes, more bed confinement and greater dependence upon physicians than people who perceived themselves as more in control of their lives. Rotter (1990) believes that the notion of control is contingent upon peoples' reinforcement history, so that people who are accustomed to success will go on believing that they will succeed.

Perceived control thus seems to be related to health outcomes (Langer & Rodin, 1976; Schulz, 1976; Schulz & Hanusa, 1978; Seeman & Seeman, 1983; Suls & Mullen, 1981; Taylor et al., 1991; Taylor et al., 1984). Many attempts have been made to understand how this connection operates. Levenson (1981) developed the tri dimensional scale of control, to measure Internal control, Powerful Others control and Chance control. This was done in order to distinguish those who might gain from an external locus of control by following professional directions from those who believed that sheer luck or chance governed their fate. Chance locus of control has been found to be related to tendencies to speed when driving (Tomasdottir et al., 1990), and Powerful Others locus of control to be related to more somatic complaints than Internal locus of control (Davidsdottir, 1993).

Wallston et al. (1978) built further upon Levenson's (1981) work by developing the Multidimensional Health Locus of Control Scale (HLC), which assesses people's beliefs about health and health behaviors. This scale has been widely used. Among findings is a relationship of the HLC to physical fitness (Brandon & Loftin, 1991; O'Connell & Price, 1982), anxiety and depression (Quinn & Norris, 1986), and smoking reduction (Kaplan & Cowles, 1978, as cited in Wallston and Wallston, 1981). Wallston (1992) has, however, modified the HLC to include other concepts of Rotter's (1954; 1990) social learning theory, such as outcome and behavioral expectancy. Wallston's modified measure, the Health Hardiness Inventory, measures health value, responsibility for health and capability of performing health conducive behaviors. The hardiness construct indicates a relationship to Kobasa's (1979) finding that positive health outcomes were related to a sense of control, commitment to self, and the idea that changes is a challenge rather than a threat.

Optimism has also been linked to health-related outcomes. Scheier and Carver (1985) have conceptualized dispositional optimism as a dispositional tendency to hold generalized expectancies for "good" or "bad" outcomes. This perspective is largely based on behavioral self-

regulation, the notion that people make efforts to attempt to attain goals based on their outcome expectancies. Optimists, in general, have been found to use more problem focused coping than pessimists (Scheier, Weintraub & Carver, 1986). Other studies have found positive health outcomes to be related to optimism and negative outcomes to pessimism. In one such study, a pessimistic explanatory style was found to predict physical illness after thirty-five years (Peterson et al., 1988). An optimistic orientation has also been found to be predictive of successful completion of aftercare treatment for alcoholics (Strack et al., 1987); good outcome from coronary artery bypass graft (Scheier et al., 1999; as cited in Schwenk, 1999); and tendencies to take active steps to combat physical illness (Lin & Peterson, 1990).

Stress has also been related to health outcomes. For instance, stress has been found to reduce immune system activity and thus adversely affect health. It has been found that perceived stress reduces cytotoxicity in natural killer cells (Segerstrom et al., 1998); increases likelihood of back pain (Bru et al., 1997); and is associated with mental disorders as measured by the Millon Clinical Multiaxial Inventory (Sinha & Watson, 1997). Despite the plethora of research on stress, it is not simple to measure. Several measures of stress have been developed. For instance, Holmes and Rahe (1967) used a scale of both negative and positive life events that would require adaptation. However, a drawback to this approach is that the same life events may produce stress in one person and not in another, depending on their perception of the stressor. Therefore, Cohen and Williamson (1988) developed a scale for perceived stress. They found that many health-related behaviors are associated with lower outcomes on the scale, among these are acquiring adequate sleep, eating breakfast, low alcohol consumption and little or no drug use.

Another construct associated with health is Type A behavior (TAB), which has been identified as a risk factor associated with the incidence and prevalence of various forms of coronary heart disease (Friedman & Rosenman, 1974). This behavior pattern is often conceptualized as including excessive competitive and hard driving behavior, hostility, impatience, and exaggerated speech mannerisms (loudness, rapid speech, and verbal competition). The Type B individual, conversely, is relatively free of these TAB characteristics. Differences between the two types have consistently been found (Becker and Byrne, 1984; Grimm and Yarnold, 1985; Yarnold et al., 1987). The TAB pattern has been associated with attempts to gain control over salient events (Glass, 1977; Matthews, 1982).

Anxiety has been found to coincide with negative health outcomes. Anxiety can be conceptualized as a vague feeling of uneasiness or apprehension that often involves a relatively uncertain or unspecified threat (Sarafino, 1998). What people fear is often related to their age (Graziano et al., 1979; Sarafino, 1986). For instance, children fear concrete or tangible things, but their fears become more abstract and social when they get older. Spielberger (1972) defines a difference between trait anxiety and state anxiety. Trait anxiety refers to relatively stable individual differences in anxiety proneness, that is, in the tendency to perceive stressful situations as dangerous or threatening and respond with elevations in the intensity of their state anxiety reactions. It would therefore seem likely that trait anxiety is more predictive of somatic complaints than state anxiety, as people that are high in state anxiety at a given moment may not be any more likely than others to be anxious in general (Spielberger, 1972). On the other hand, those that are high in trait anxiety might be expected to be generally more anxious than others.

This notion is further strengthened by findings indicating that acute pain increases anxiety, which again decreases as soon as the pain subsides. Chronic pain, on the other hand, increases anxiety, and as the pain is not subsiding, the anxiety seems to increase pain perception, which again increases anxiety, forming a vicious circle (Feuerstein et al., 1987; McGowan et al., 1998). Thus, there is a different pattern of anxiety for acute pain on one hand and chronic pain on the other hand.

None of the constructs mentioned above operate in a vacuum. Life offers all kinds of events, and when unpleasant events befall people, they attribute causes to those events (Peterson et al., 1988). Three dimensions of these explanations have been investigated. The first is stability (invoking a long-lasting factor, “it's never going to go away”), versus instability (transient, “it was a onetime thing”). The second one is globality (affecting a wide domain of activities, “it's going to ruin everything I do”) versus specificity (a specific cause is determined, “it has no bearing on my life”). The last one is internality (something about the self, “it's me”) versus externality (other people or circumstances, “it's the heat in this place”) (Peterson et al., 1988). One way to conceptualize optimism versus pessimism, perhaps, is to determine the attributional style people use. Those who use stable, global and internal causes for unpleasant events befalling them have been classified as pessimistic, and those who use unstable, specific and external causes as optimistic. Petersen et al. (1988) found that those who used the pessimistic style of attributions at the age of 25 were more likely to be dead or in poor health thirty-five years later than those who used an optimistic style. Also, Lin and Peterson (1990) found that pessimists reported more frequent illnesses than optimists. The measurement of this attributional style is likely to correlate with Scheier and Carver's (1985) Life Orientation Test for optimism and pessimism.

In addition to the psychological variables mentioned previously, several lifestyle variables have been related to physical health. One health related behavior often associated with less overall health and well-being is heavy alcohol consumption (for this paper termed alcoholism). Alcoholism is a condition that encompasses the person both physically, socially, emotionally and spiritually (Kissin & Begleiter, 1983; Milam & Ketcham, 1981; Schuckit et al., 1985), and it is considered a disease by a number of authorities, including the American Medical Association and the American Psychological Association (AMA, 1998; APA 2001). It is characterized by a large intake of alcohol which in the short term provides euphoria, but in the long term is often quite toxic for the body (Sullivan et al., 2002). Alcoholics often experience much stress on account of their condition, as their behavior is often deemed unacceptable by significant others (Gorski & Miller, 1984). It is therefore logical to expect alcoholics to be ill more often than others. In an earlier study, this claim was supported (Davidisdottir, 1993), by a strong relationship between alcoholism and somatic complaints.

Another behavior often deemed unhealthy is smoking. It is widely known that smoking is a serious hazard to health. In a report of the Surgeon General (Centers for Disease Control, 1990) two of the main conclusions are that former smokers live longer than continuing smokers, and smoking cessation has major and immediate health benefits. However, it is common knowledge that many people find it difficult to stop smoking (American Lung Association, 2003; National Cancer Institute, 2000).

Exercise has repeatedly been associated with health outcomes. Those who exercise regularly are generally healthier than those who do not (Ballard Barbash et al, 1990; Cohen and Williamson, 1988; Frederiksson et al, 1989; Perlmutter, 1990; Wu et al, 1987). However, too large doses of exercise at a time have the same effects as stress does on the immune system, and may elicit illness (Perlmutter, 1990). If stress is a mediating variable between the mind and illness outcomes for the body, then exercise seems to be an effective way to block the stress, as perceived stress and exercise have been found to have a strong, negative correlation (Davidsdottir & Tomasdottir, 1991).

As “normal” young people, compared to older people, may not yet have experienced long term effects from their lifestyle or their psychological processes, it might be of interest to look at how these are associated with somatic complaints in their daily functioning. “Full blown” diseases often have antecedents in the form of discomfort, pains and infections that people experience in their daily lives. Adolescents may not have used nicotine or alcohol for many years, relative to their older counterparts, but they may have felt the effects of anxiety and stress, as well as other psychological processes, for some time. They may also be less likely to have developed serious disorders resulting from either psychological process or lifestyle, but they may have felt some physical effects through day-to-day issues, such as headaches, respiratory infections and other somatic complaints.

It is important to look into the behaviors and psychological processes of young adolescents as these are often predictive of later health or disease. It has, for example, been found that physical activity and fitness in youth are negatively related to cardiovascular disease risk factors (Barnekow et al., 1998; Boreham et al., 2002; Hasselstrøm et al., 2002; Janz et al., 2002; Lefevre et al., 2002; Nicklas et al., 2002; Twisk et al., 2002) and loss of bone mass (Delvaux et al., 2001) in adulthood. One study found in a meta-analysis of the literature on substance abuse prevention that substance abuse in young adulthood can be predicted from factors already apparent in childhood (Belcher & Shinitzky, 1998).

When results from the studies included herein are considered, it becomes clear that behaviors and psychological processes in childhood and adolescence can be predictors of health or disease in adulthood. Young adults may therefore be an appropriate population to try out the effects of these behaviors and psychological processes on their health. While several studies, as described in this paper, have found relationships between physical health and psychological and lifestyle variables, these studies have not attempted to analyze simultaneously effects of several psychological and lifestyle variables on general physical health. The purpose of this study, therefore, is to explore the relationships between psychological processes, lifestyle and somatic complaints in an older adolescent population. According to the literature, the following psychological and lifestyle variables can be expected to be indicators of somatic complaints: a) pessimism, b) high levels of perceived stress, c) Type A behavior, d) stable, global and internal attributions for unpleasant events, e) alcoholism, f) smoking. Variables expected to be protective for health (negatively associated with somatic complaints) are: a) high levels of health control, health commitment and health challenge, b) optimism, c) unstable, specific, external attributions for unpleasant events, and d) exercise.

Method

Participants

Participants included 105 psychology undergraduate students at a Midwestern university in the USA, 21 males and 76 females (gender indication was missing for 8 subjects). Mean age of the sample was 18.6 years ($SD = 0.9$ years). Ages ranged from 17-21 years. No participants were married or had children. Twenty-two of the subjects lived at home, and 83 in college housing.

Instruments Measuring Psychological Variables

Life Orientation Test (LOT; Scheier & Carver, 1985), is a measure of dispositional optimism. It consists of eight statements (four worded positively and four negatively) such as “Things never work out the way I want them to” and “I’m always optimistic about the future.” Subjects respond by indicating on a 5-point scale how much they agree or disagree with each item. Scheier and Carver (1985) reported internal consistency for the scale as .76 and test-retest reliability after 4 weeks as .79. Reliability in this study was found to be .76.

Perceived Stress Scale (Cohen & Williamson, 1988) is a 10-item questionnaire, composed of negatively and positively worded items for assessing perceived stress. Examples of the items are “In the last month, how often have you felt nervous and “stressed?” and “In the last month, how often have you felt that you were on top of things?” Cohen and Williamson report internal reliability for the scale as .78. In this study, reliability of the scale was .83.

Student Jenkins Activity Survey, short version (Bryant & Yarnold, 1989). This is a 21-item questionnaire for measuring Type A behavior (TAB). Participants respond by rating themselves, using a Gutman scale. Various factors have been found to underlie this scale, but among the most common are Hard Driving, Job Involvement and Speed/Impatience. For American students completing the SJAS, Cronbach's alpha has been estimated for total and subscale scores between .45 and .72 (Yarnold & Mueser, 1989; Yarnold et al., 1986). In this study, reliability of .69 was found for the total scale.

State-Trait Anxiety Inventory (Form Y) (Spielberger, 1983). In this study, form Y-2 was used, which is a 20-item questionnaire for measuring trait anxiety. It consists of questions, such as “I feel nervous and restless”, to which respondents are asked to respond on a 4-point Likert scale from 1 (*almost never*) to 4 (*almost always*). Test-retest correlations for trait anxiety in college students range from .73 to .86, and Alpha reliability has been shown to be .90. In this study, it was .92.

Expanded Attributional Style Questionnaire (Peterson & Villanova, 1988) consists of questions about 24 hypothetical unpleasant events involving the respondents. Participants are asked to imagine the event happening to them. They then write “the one major cause of the event” and rate it on a scale from 1 to 7 for internality versus externality, stability versus instability and globality versus specificity. Cronbach's coefficient alphas have been shown to be .66 for internality, .85 for stability and .88 for globality. Reliability in this study for internality, stability, globality, and importance of events for good events were .29, .34, .54, and .66, respectively, and for unpleasant events were .51, .61, .70, and .70, respectively. As reliability for good events is on the lower side, these scales were not further analyzed in this study.

Health Hardiness Inventory (Wallston, 1992). This is a 31-item questionnaire measuring three dimensions of perceived health control in which people respond to statements on a 5-point Likert scale from 1 (*strongly disagree*) to 5 (*strongly agree*). The dimensions are Health control, Health commitment, and Health challenge. Health control is measured by 11 statements, such as “I am in control of my health.” Nine statements, such as “I am willing to make daily sacrifices for good health” measure Health commitment. Health challenge is measured by 11 statements, such as “Few things upset me more than the possibility of becoming seriously ill.” The internal consistency of this scale has been found satisfactory. In this study, reliability for health control was .73, for health commitment it was .83, for health challenge .51, and for the scale as a whole it was .85.

Instruments Measuring Lifestyle

A screening test for alcoholism, *AUDIT* (Alcohol Use Disorders Identification Test), developed by World Health Organization (Babor & Grant, 1989). This is a 10-item questionnaire developed in six countries from a 150-item instrument for screening alcoholism. Responses to questions such as “How often do you have six or more drinks on one occasion?” were responded to from *never* (0) to *daily or almost daily* (4). Scores may range from 0-40. Of known alcoholics in a group of 2000 patients attending health care facilities in the six countries, 99% had a score of 10 or more on this scale, and 94% had a score of 8 or more. According to guidelines from the National Institute on Alcohol Abuse and Alcoholism (2003), a score of 8 or higher on this test indicates a serious alcohol problem. Therefore, those scoring 8 or higher were classified as alcoholics. Reliability for the scale in this study was .84.

Smoking was assessed with a single question. Respondents were asked to tick a box next to one of eight statements about smoking that best described them. The statements ranged from “I have never smoked a cigarette, not even a puff” to “I usually smoke more than 20 cigarettes per day”.

Frequency of exercise was also tested with a single question. Respondents were asked to tick a box next to one out of seven statements that best described their physical activity. They indicated how often they had participated in physical exercise over the past two weeks. Possible responses ranged from never to almost daily.

Instrument Measuring Dependent Variable

Symptom Checklist (SCL-90), subscale for somatization (Shutty et al., 1986). The SCL-90 is a multidimensional self-report inventory, originally developed from the Hopkins Symptoms Checklist, composed of 90 items, each describing physical or psychiatric symptoms. The instructions require the respondent to indicate on a 5-point scale (*ranging from not at all* (0) to *extremely* (4) how much a given symptom, such as for example having chest pain or headaches, has caused discomfort during the past 2 months. The instrument consists of nine subscales, of which only the 12-item scale for Somatization was used. Factorial evidence has been consistently

Table 1: Correlations between tested variables

[illegible]

reported for these scales (Clark & Friedman, 1983; Evenson et al., 1980; Hoffman & Overall, 1978; Holcomb et al., 1983; all as cited in Shuttie et al., 1986). In an earlier study, reliability between .74 and .77 has been found for subscales of Somatization (Shuttie et al., 1986). Reliability in this study was .83.

Results

Tested variables were correlated in order to see which of them were associated with Somatization. Results are shown in Table 1. Pessimism, Type A, Perceived stress and Anxiety all showed a significant relationship with Somatization, as was anticipated. The only aspects of Explanatory styles that had a relationship with somatic complaints were Global attributions for unpleasant events.

Both Health control and Health challenge had a significant protective relationship with Somatic complaints, indicating that people who perceived that they were in control of their health and regarded health problems as a challenge were less likely to have somatic complaints than others. However, Health commitment, or the degree to which people valued their health and were willing to commit themselves to behaviors conducive to better health, did not show the same outcome. Although the relationship was in the same direction, it was very weak and not statistically significant.

There was no significant relationship between responses to the scale for Alcoholism and Somatization. Eighteen people were classified as alcoholics in the sample and a t -test did not indicate that they had any more somatic complaints than those classified as non-alcoholics, $t(103) = -0.54, n.s.$. Smokers did not report significantly more somatic complaints than nonsmokers, $t(103) = 0.01, n.s.$. There were 80 nonsmokers in the sample and 25 smokers. This could indicate that adverse health effects of heavy drinking and smoking had not yet begun for this sample.

Although there seemed to be a trend in the data for those who exercised twice a week or more often to be in better health than those who exercised less often than that, as can be seen in Table 2, this trend was not significant, $t(103) = -0.12, n.s.$ Thirty-three respondents exercised less than twice a week, and 72 exercised twice a week or more.

In order to contrast psychological variables with lifestyle variables, two multiple regression analyses were conducted. The first one was done in two blocks, where the psychological variables were entered into the first block, and the lifestyle variables in the second block, in order to see whether the lifestyle variables would add significantly to explanation of variance in the sample. Results from this analysis are shown in Table 3.

The only variables which had a significant relationship with somatization in the regression analyses were Health control, which predicted less Somatization with higher health control, whereas Stress and Global explanatory style for unpleasant events predicted more Somatization with higher scores. As Life Orientation, Stress and Anxiety were associated with Somatization as can be seen in Table 1, it would be reasonable to assume that Life Orientation and Anxiety would also be associated with Somatization in the regression analysis. However, Stress, Life orientation and Anxiety were all highly correlated, therefore, most of the variance in Anxiety and Life

Table 2: Somatic complaints of exercisers and non-exercisers

Exercise	Somatization	
	Low	High
Less than twice a week	16	17
Twice a week or more	42	30

Table 3: Multiple regression analysis of lifestyle variables and psychological variables with somatization as the dependent variable

	<i>B</i>	<i>SE</i>	β	<i>t</i>
Model 1				
Health control	-.31	.14	-.29	-2.28*
Health commitment	.26	.14	.23	1.85
Health challenge	-.17	.15	-.12	-1.17
Life orientation	.01	.17	-.01	-.02
Stress	.50	.15	.46	3.36**
Type A	.11	.19	.05	.57
Anxiety	.01	.12	-.12	-.71
Internal style for unpleasant events	.01	.12	.02	.25
Stable style for unpleasant events	.01	.17	-.04	-.41
Global style for unpleasant events	.28	.13	.24	2.16*
Importance of unpleasant events	-.12	.13	-.09	-.86
Model 2				
Health control	-.32	.14	-.30	-2.27*
Health commitment	.26	.15	.23	1.78
Health challenge	-1.89	.15	-.15	-1.25
Life orientation	-.01	.18	-.02	-.14
Stress	.48	.16	.44	3.02**
Type A	.11	.20	.06	.55
Anxiety	-.01	.12	-.08	-.47
Internal style for unpleasant events	.01	.13	.03	.33
Stable style for unpleasant events	-.01	.17	-.04	-.35
Global style for unpleasant events	.27	.13	.23	2.03*
Importance of unpleasant events	-.11	.14	-.09	-.83
Alcohol use	.10	.17	.07	.61
Smoking	-.01	.13	-.01	-.04
Exercise	-.01	.14	.01	-.01

* $p < .05$ ** $p < .01$

Orientation may already have been explained. Some of the variance in Health challenge may also have been already explained in Health control.

Explained variance was then inspected for this model, as well as for another regression analysis, where lifestyle variables were entered into the equation as a first block, and psychological variables as a second block. This was done in order to see how much variance lifestyle variables explained over and above the variance explained by psychological variables. Results are shown in Table 4a and 4b.

Psychological variables explained about 40% of the variance in Somatization. As can be seen in Table 4a and 4b, lifestyle variables did not add a significant explanation of variance in Somatization over and above the variance explained by psychological variables. In the second analysis, Anxiety was entered into the equation before Life orientation and Stress. However, Stress still explained a significant portion of the variance in Somatization, whereas neither Life Orientation nor Anxiety did. The same applies for the constructs in Health Hardiness. Health Challenge was entered into the equation before Health Control, however, Health Control was still the only one of the constructs within Health Hardiness which explained a significant portion of the variance in Somatization.

Table 4a: Multiple regression analysis where lifestyle variables are entered as a first block and psychological variables as a second block

Model	<i>R</i>	<i>R</i> ²	<i>R</i> ² Δ	Δ <i>R</i> ²	<i>SE</i>	<i>F</i>	<i>F</i> Δ	<i>p</i>
1 ^a	.06	.01	.01	-.03	7.3	0.11	0.11	.960
2 ^b	.63	.40	.39	.29	6.1	3.64	4.60	.001

a. Predictors: Alcoholism, smoking, exercise

b. Predictors: Alcoholism, smoking, exercise, Anxiety, Stress, Life orientation, Type A, Explanatory style for unpleasant events: Global, Stable, Internal, and Importance of unpleasant events; Health control, Health commitment, and Health challenge.

Table 4b: Multiple regression analysis where psychological variables are entered as a first block and lifestyle variables as a second block

Model	<i>R</i>	<i>R</i> ²	<i>R</i> ² Δ	Δ <i>R</i> ²	<i>SE</i>	<i>F</i>	<i>F</i> Δ	<i>p</i>
1 ^a	.63	.39	.39	.32	5.9	5.41	5.41	.001
2 ^b	.64	.40	.01	.30	6.0	4.13	0.32	.810

a. Predictors: Stress, Life orientation, Anxiety, Type A, Explanatory style for unpleasant events: Internal, Stable, Global, and Importance of unpleasant events; Health challenge, Health control, and Health commitment.

b. Predictors: Alcoholism, smoking, exercise, Stress, Life orientation, Anxiety, Type A, Explanatory style for unpleasant events: Internal, Stable, Global, and Importance of unpleasant events; Health challenge, Health control, and Health commitment.

Discussion

An important finding in this study was that the behavior of this sample of undergraduate students seemed to be rather health-conscious in general, at least with regard to the tested variables. The nonsmokers outnumbered the smokers, and few people were classified as alcoholics in the sample. Likewise, considerably more people exercised regularly than those who did not exercise. This is a positive finding and should not be overlooked as such.

Another important finding was that psychological variables explained almost half of the variance in somatic complaints, whereas lifestyle variables hardly explained any of that variance. Though adverse effects of an unhealthy lifestyle probably may not yet have been manifested at the age of 17-21, as this sample was, preceding signs of such effects may be seen in somatic complaints. Even if this was the only health measure, as must be considered a limitation of the study, it is an indication of well-being or lack thereof, and as such it is important to examine further.

It seems clear from the regression analyses that Stress and Global explanations for unpleasant events are the strongest predictors of somatic complaints. Although both Anxiety and a pessimistic Life orientation correlated with Somatic complaints, they did not explain as much variance in these complaints as Stress and Global explanations for unpleasant events.

The sample was quite homogenic, as should be considered a limitation of the study, all the participants were young adults attending university, either living at home or in college housing. However, this combination allows examining the forces associated with the well-being of this population, which might give some insights into further development of their health status.

It would seem from the results of this study that health promoters and mental health practitioners working with young adults would do well to consider how psychological factors are associated with their health and well-being, at least not to a lesser extent than their lifestyle. How they manage their stress, how they explain to themselves negative events in their lives, and how much control they believe they have over their own health all seem to be factors strongly associated with their well-being and so should be considered when experts try to help them promote their health.

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